

Table 7-5. Threatened and endangered species, special species of concern, formerly Category 2 (C2) species, and sensitive species that may be found on the INEEL. Species in bold are those assessed in the WAG 4 ERA.

Common Names ^{a,b}	Scientific Name ^{a,b}	Federal Status ^{c,d}	State Status ^d	BLM Status ^d	USFS ^g Status ^d
Plants					
Lemhi milkvetch	<i>Astragalus aquilonius</i>	X	S	S	S
Painted milkvetch ^f	<i>Astragalus ceramicus</i> var. <i>apus</i>	3c	R	X	X
Plains milkvetch	<i>Astragalus gilviflorus</i>	NL	I	S	S
Winged-seed evening primrose	<i>Camissonia pterosperma</i>	NL	S	X	X
Nipple cactus ^f	<i>Coryphantha missouriensis</i>	NL	R	X	X
Spreading gilia	<i>Ipomopsis</i> (=Gilia) <i>polycladon</i>	NL	2	S	X
King's bladderpod	<i>Lesquerella kingii</i> var. <i>cobrensis</i>	X	M	X	X
Tree-like oxytheca ^f	<i>Oxytheca dendroidea</i>	NL	R	R	X
Inconspicuous phacelia ^e	<i>Phacelia inconspicua</i>	C2	SSC	S	S
Puzzling halimolobos	<i>Halimolobos perplexa</i> var. <i>perplexa</i>	X	X	X	S
Ute ladies' tresses ^e	<i>Spiranthes diluvialis</i>	LT	X	X	X
Birds					
Peregrine falcon	<i>Falco peregrinus</i>	LE	E	X	X
Merlin	<i>Falco columbarius</i>	NL	X	S	X
Gyr falcon	<i>Falco rusticolus</i>	NL	SSC	S	X
Bald eagle	<i>Haliaeetus leucocephalus</i>	LT	T	X	X
Ferruginous hawk	<i>Buteo regalis</i>	C2	SSC	S	X
Black tern	<i>Chlidonias niger</i>	C2	X	X	X
Northern pygmy owl ^e	<i>Glaucidium gnoma</i>	X	SSC	X	X
Burrowing owl	<i>Athene cunicularia</i>	C2	X	S	X
Common loon	<i>Gavia immer</i>	X	SSC	X	X
American white pelican	<i>Pelicanus erythrorhynchos</i>	X	SSC	X	X
Great egret	<i>Casmerodius albus</i>	X	SSC	X	X
White-faced ibis	<i>Plegadis chihi</i>	C2	X	X	X
Long-billed curlew	<i>Numenius americanus</i>	3c	X	S	X
Loggerhead shrike	<i>Lanius ludovicianus</i>	C2	NL	S	X
Northern goshawk	<i>Accipiter gentilis</i>	C2	S	X	S
Swainson's hawk	<i>Buteo swainsoni</i>	X	X	S	X
Trumpeter swan	<i>Cygnus buccinator</i>	C2	SSC	S	S
Sharptailed grouse	<i>Tympanuchus phasianellus</i>	C2	X	S	S
Boreal owl	<i>Aegolius funereus</i>	X	SSC	S	S

Table 7-5. (continued).

Common Names ^{a,b}	Scientific Name ^{a,b}	Federal Status ^{c,d}	State Status ^d	BLM Status ^d	USFS ^e Status ^d
Flammulated owl	<i>Otus flammeolus</i>	X	SSC	X	S
<u>Mammals</u>					
Gray wolf ^h	<i>Canis lupus</i>	LE/XN	E	X	X
Pygmy rabbit	<i>Brachylagus (=Sylvilagus) idahoensis</i>	C2	SSC	S	X
Townsend's western big-eared bat	<i>Corhynorhinus (=Plecotus) townsendii</i>	C2	SSC	S	S
Merriam's shrew	<i>Sorex merriami</i>	X	S	X	X
Long-eared myotis	<i>Myotis evotis</i>	C2	X	X	X
Small-footed myotis	<i>Myotis ciliolabrum (=subulatus)</i>	C2	X	X	X
Western pipistrelle ^e	<i>Pipistrellus hesperus</i>	NL	SSC	X	X
Fringed myotis ^e	<i>Myotis thysanodes</i>	X	SSC	X	X
California myotis ^e	<i>Myotis californicus</i>	X	SSC	X	X
<u>Reptiles and Amphibians</u>					
Northern sagebrush lizard	<i>Sceloporus graciosus</i>	C2	X	X	X
Ringneck snake ^e	<i>Diadophis punctatus</i>	C2	SSC	S	X
Night snake ^f	<i>Hypsiglena torquata</i>	X	X	R	X
<u>Insects</u>					
Idaho pointheaded grasshopper ^e	<i>Acrolophitus punchellus</i>	C2	SSC	X	X
<u>Fish</u>					
Shorthead sculpin ^e	<i>Cottus confusus</i>	X	SSC	X	X

a. This list was compiled from a letter from the U.S. Fish and Wildlife Service (USFWS July 16, 1997) for threatened or endangered, and sensitive species listed by the Idaho Department of Fish and Game Conservation Data Center (CDC 1994 and IDFG web site 1997) and Radiological Environmental Sciences Laboratory documentation for the INEL (Reynolds et al., 1986).

b. Species in **bold** are those species individually assessed in the WAG 4 ERA.

c. The USFWS no longer maintains a candidate (C2) species listing but addresses former listed species as "species of concern" (USFWS April 30, 1996). The C2 designation is retained here to maintain consistency between completed and ongoing INEEL ERA assessments.

d. Status codes: INPS = Idaho Native Plant Society; S = sensitive; 2 = State Priority 2 (INPS); 3c = no longer considered for listing; M=State of Idaho monitor species (INPS); NL = not listed; 1 = State Priority 1 (INPS); LE = listed endangered; E = endangered; T = threatened; XN = experimental population, nonessential; SSC = species of special concern; and C2 = see item c, formerly Category 2 (defined in CDC 1994). BLM = Bureau of Land Management; R = removed from sensitive list (non-agency code added here for clarification).

e. No documented sightings at the INEEL; however, the ranges of these species overlap the INEEL and are included as possibilities to be considered for field surveys.

f. Recent updates resulting from Idaho State Sensitive Species meetings: (BLM, USFWS, INPS, USFS) - (INPS 1995; 1996)

g. United States Forest Service (USFS) Region 4.

h. Anecdotal evidence exists that isolated wolves have occurred on the INEEL, but it is unlikely wolves regularly hunt or breed on site (Morris 1998).

species has since been determined to occur in greater abundance than originally believed and has been removed from the INPS and BLM lists (CDC 1996). No T/E plant species have been recorded at CFA or in areas immediately surrounding the facility.

Avian T/E species or species of concern with a potential for occurrence in the vicinity of WAG 4 include the ferruginous hawk (*Buteo regalis*), peregrine falcon (*Falco peregrinus*), northern goshawk (*Accipiter gentilis*), loggerhead shrike (*Lanius ludovicianus*), burrowing owl (*Athene cunicularia*), bald eagle (*Haliaeetus leucocephalus*), white-faced ibis (*Plegadis chihi*), black tern (*Chlidonias niger*), and trumpeter swan (*Cygnus buccinator*). The bald eagle and peregrine falcon are federally listed T/E species. The remaining avian species are species of concern (formerly C2).

Four mammal species of concern (formerly C2) potentially occur in the vicinity of WAG 4. These include the pygmy rabbit [*Brachylagus* (= *Sylvilagus*) *idahoensis*], Townsend's western big-eared bat [*Corhynorhinus* (= *Plecotus*) *townsendii*], the long-eared myotis (*Myotis evotis*), and the small-footed myotis [*Myotis ciliolabrum* (= *subulatus*)]. Presence of the gray wolf has not been verified at the INEEL, however this federally listed species has also been included in the assessment for completeness. The northern sagebrush lizard (*Sceloporous graciosus*) is the only reptile species of concern with a potential presence at WAG 4.

In 1996, field surveys were conducted in the areas surrounding WAG 4 facilities to assess the presence and use of those areas by T/E species or other species of concern (i.e., species formerly designated as C2). The survey findings have been documented in draft reports that include survey protocols and results for WAG 4 (Morris 1998). Specific information collected and reported for each T/E or species of concern includes:

- Date and conditions under which the surveys were conducted;
- Area encompassed by the surveys (global positioning system [GPS] mapping where practical);
- GPS locations for observed habitat, sign, and species sighted (where practicable);
- Habitat description, the proximity to WAG or site, and an estimate of whether contaminated sites or areas are within the home range of members of the species in question;
- Species presence, abundance, current site use, past site use (historical sightings or surveys), and anticipated site use (professional judgment); and
- An estimated site or area population (where possible).

In August 1997 a field survey was conducted for individual sites of concern within CFA facilities that have been or are currently being evaluated as part the WAG 4 ERA. An on-site inspection was conducted and each site of contamination was evaluated for habitat qualities and potential to support INEEL T/E species or other species of concern. The attributes evaluated include:

- Size
- Substrate (gravel, asphalt, lawn, etc.)
- Natural or manmade features that may attract wildlife (e.g. water, lights)

- Proximity to areas or sites of facility activity
- Presence and availability of food or prey
- Available nesting, roosting or loafing habitat
- Signs of wildlife use
- Prior history, known wildlife sightings or use.

Attributes were subjectively rated for positive contributions to overall habitat suitability. An overall site rating of high, medium, low, or none was assigned based on the number of positive habitat features and probability that the species of concern may use or uses the site. The conventions upon which ratings were assigned for individual habitat attributes are summarized in Table 7-6. Although T/E and species of concern were of primary consideration, potential use by game species and unique populations (Great Basin spadefoot toad and Merriam's shrew) was also assessed.

Sites for which risk to receptors has been calculated ($HQ > 1$) but for which no positive habitat attributes were observed are unlikely to contribute to wildlife exposures. Sites rated overall as "low" are those having one or two positive attributes and therefore potential for incidental use by wildlife. These sites also may be generally discounted as contributing significantly to chronic wildlife contaminant exposures.

Results of the survey and ratings for the sites of concern are summarized in Table 7-7 and are discussed for each species of concern in the paragraphs below. These surveys were conducted to allow evaluation of sites of concern in an ecological context. The duration and rigor of these surveys were not adequate to verify presence or frequency of occurrence, but were conducted to allow evaluation of WAG 4 sites of concern in an ecological context. The rankings for sites presented here are subjective, based on professional opinion supported by limited observation. Surveys for some species were also supported by GIS analyses using recently developed habitat models.

Table 7-6. Habitat rating conventions for WAG 4 sites of concern.

Attribute	Examples
Size	Areas having physical dimensions too small to support species of interest were rated "none" unless enhanced by other attributes. Large, unconfined areas adequate to support wildlife were assigned higher ratings.
Substrate	Asphalt = none, gravel = low, lawn, soil = medium-high for some species, disturbed vegetation community = medium to high, natural vegetation community = high.
Natural or manmade features	Water = high (water [permanent or ephemeral] is an important component in desert systems); lights = medium (both attract and/or support insects and consequently bats and insectivorous birds [i.e., swallows, nighthawks])
Proximity to areas of activity	Proximity to areas or sites of moderate or heavy activity may reduce desirability. Sites associated with buildings and facilities may be more suitable if abandoned or little used (i.e., bat roosts).
Nesting, roosting, or loafing habitat	Structures such as fence and power poles adjacent to open fields afford perches for roosting and hunting etc.
Signs of wildlife use	Signs of wildlife use that qualitatively feed the evaluation. Examples of these signs include observation of animals, tracks, hair, or scat.
Prior history	Documented or reported sightings.

Table 7-7. Summary of WAG 4 sensitive species survey completed on August 20, 1997.

WAG 4 Site #	Black Tern	Trumpeter Swan	White-faced Ibis	Burrowing Owl	Ferruginous Hawk	Peregrine Falcon	Loggerhead Shrike	Bald Eagle	Bats	Merriam's Shrew	Pygmy Rabbit	Northern Sagebrush Lizard	Spadefoot Toad	Game species	Comments
CFA-01			H	H	H	M	M	L				H	M		Landfills, crested wheatgrass plantings, power lines and fence perching
CFA-02															Landfills, crested wheatgrass plantings, power lines and fence perching
CFA-03															Landfills, crested wheatgrass plantings, power lines and fence perching
CFA-04			H	H	H	H	M	M			M	H	H		Unfenced, ephemeral water, native and planted communities, good perches, low activity
CFA-05			M	L	L	L			L	L	L	H	M		Unfenced, native community, gravel substrate, intermittent water, adjacent powerlines
CFA-10				L	L	L		L				M	L		Small area, gravel substrate, open gates, weedy and good cover for small mammals
CFA-12													L		Adjacent to building wall, landscaped bed, adjacent lawn, removal action, rabbits, killdeer, mule deer
CFA-26															Asphalt adjacent to railroad tracks, building overlies site; eliminated from assessment.
CFA-40												L			Gravel substrate, open wire fencing, adjacent to warehouse, excessed equipment, small animal cover
CFA-41												L			Gravel substrate, open wire fencing, adjacent to warehouse, excessed equipment, small animal cover
CFA-43															Lead storage area
CFA-50															Gravel substrate, adjacent to railroad tracks, shallow well, removal action, elevated metals

Positive habitat attributes:

H = High

M = Medium

L = Low

A blank indicates no positive habitat attributes.

Bald Eagle—Sites CFA-01 and CFA-04 are the only CFA sites posing a potential for exposure since these sites are large, unfenced areas that are removed from facility activity and provide good perching areas. Sites CFA-02, CFA-03, CFA-05, CFA-10, CFA-12, CFA-26, CFA-40, CFA-41, CFA-43, and CFA-50 have no positive habitat features and are unlikely to contribute to bald eagle contaminant exposures.

Burrowing Owl—Three sites (CFA-01, -04, and -05) demonstrated positive habitat features for this species. Both CFA-01 and CFA-04 were rated “high” in part due to size and potential nesting habitat. CFA-05 was rated “medium” due to the presence of a gravel substrate that may restrict nesting but may be a positive attribute for hunting (i.e., native community and perching structures).

Loggerhead Shrike—Sites CFA-01 (“medium”) and CFA-04 (“high”) both pose potential for exposure since these areas provide perches and have, or are adjacent to native communities. There is little likelihood that exposure to loggerhead shrikes will occur as a result of contaminants associated with sites CFA-02, CFA-03, CFA-12, CFA-26, CFA-40, CFA-41, CFA-43, and CFA-50. Sites CFA-05 and CFA-10 both were rated as having a “low” potential for contributing to loggerhead shrike contaminant exposures.

Northern Goshawk, Ferruginous Hawk, and Peregrine Falcon—Sites CFA-01 and CFA-04 both show a “high” potential for exposure primarily because of large open areas and available perches for hunting. No positive habitat features were found at sites CFA-02, CFA-03, CFA-12, CFA-26, CFA-40, CFA-41, CFA-43, and CFA-50. Sites CFA-05 and CFA-10 both show a “low” potential for exposure to contaminants of concern.

Gray Wolf—Anecdotal evidence of isolated wolves on the INEEL exists, but it is unlikely wolves regularly hunt or breed on site (Morris 1998). The gray wolf is a federally listed endangered species and is, therefore, represented in this assessment by functional group M322 as a conservative measure to ensure all potential receptors having special status have been evaluated.

Pygmy Rabbit—Only sites CFA-04 and CFA-05 demonstrate positive habitat features that may support pygmy rabbits. Presence of native shrub communities, ephemeral water and low activity around and near the CFA-04 site constitute “medium” potential for occurrence of pygmy rabbits. Although similar to CFA-04, a gravel substrate at site CFA-05 is likely to restrict burrowing by pygmy rabbits and is, therefore, rated overall as having “low” potential for contributing significantly to pygmy rabbit contaminant exposures.

Northern Sagebrush Lizard—Sites CFA-01, CFA-04 and CFA-05 have the greatest potential for contributing to sagebrush lizard contaminant exposures at WAG 4. It is unlikely sagebrush lizards will be exposed to contaminants associated with WAG 4 sites CFA-02, CFA-03, CFA-12, CFA-26, CFA-43 and CFA-50. CFA-40 and CFA-41 have a slightly higher potential for exposure and therefore were rated as “low”. Because CFA-10 is a small area with open gates and weeds that provide a good cover for small animals, this site was rated as having “medium” exposure potential.

Townsend’s Western Big-Eared Bat, Long-Eared Myotis, and Small-Footed Myotis—The insect prey associated with the large areas of native vegetation at CFA-04 has medium potential for attracting feeding bats. Other sites which are open and support significant areas of vegetation include CFA-01, CFA-05 and CFA-10. However, these areas primarily support non-native communities and therefore pose lower potential for use by bats.

Black Tern, Trumpeter Swan, and White-Faced Ibis—The black tern, trumpeter swan, and white-faced ibis are associated exclusively with water sources and have also been recorded less than

seven times site wide. Because CFA surface water impoundments which may be frequented by these species are not included in the scope of current WAG 4 CERCLA activities, they and other aquatic species were not evaluated in the ERA.

Potential risks associated with contaminant exposures for T/E and species of concern are of interest for both individuals and populations. Therefore, those species most likely to contact WAG 4 sites and contaminants of concern have been evaluated for individual exposures. Other species considered very rare INEEL-wide (see Appendix F, Table F-2) and considered unlikely to receive chronic doses through frequenting WAG 4 and surrounding areas are represented through evaluation of the functional group with which they are associated.

T/E and species of concern that were individually evaluated for exposure to contaminants at WAG 4 are listed in boldface text (see Table 7-5). These include the peregrine falcon, bald eagle, burrowing owl, loggerhead shrike, northern goshawk, pygmy rabbit, Townsend's western big-eared bat, long-eared myotis, small-footed myotis, gray wolf, and northern sagebrush lizard, all of which were evaluated for direct and indirect exposure to surface soil contaminants.

7.2.6 Stressor Identification and Characterization

DOE Guidance (DOE 1993) defines a stressor as "any physical, chemical, or biological entity that can induce adverse response." CERCLA is primarily concerned with the effects of contaminant stressors. Contaminant stressors at WAG 4 include a variety of radionuclides, organics, and metals identified at multiple sites.

Human Health Concentration Data—Data from the various human health risk assessments at the sites are solely available for the ERA. For the human health assessment, concentration data were divided into 0 to 0.15 m (0 to 0.5 ft), 0 to 1.22 m (0 to 4 ft), and 0 to 3 m (0 to 10 ft) average concentrations. For the WAG ERA, the 0 to 15 cm (0 to 0.5 ft) concentrations were used to characterize surficial soil concentrations. The subsurface concentrations, considered to be 15 cm to 3 m (0.5 to 10 ft), are based on the 15 cm to 3 m (0.5 to 10 ft) concentrations. When only 0 to 3 m (0 to 10 ft) concentrations were available for a site, these concentrations were also used to characterize 0 to 15 cm (0 to 0.5 ft) concentrations.

If data were not available from ERIS, source terms were obtained from Track 1 and Track 2 documentation. The maximum concentration from either surface or subsurface concentrations was used in all cases unless noted otherwise (see Tables 7-8 and 7-9).

7.2.6.1 Screening of Contaminants. This section provides the screening of contaminants against both background concentrations (Rood et al. 1995) and ecologically based screening levels (EBSLs) to identify COPCs for the WAG ERA. All EBSLs were calculated specifically for use at the INEEL. The complete methodology and documentation of the development of EBSLs will be included in the OU 10-04 Work Plan. Appendix I presents a summary of the approach.

The sites and the contaminants at those sites to be evaluated in this assessment were previously identified in Table 7-3. Tables 7-8 through 7-10 present the summary of the results comparing maximum site concentrations to the EBSL and background values (if available) for inorganic, organic, and radionuclide contaminants, respectively. The concentrations are maximum site concentrations unless otherwise noted. The site information is detailed in Appendix K. However, for sites that are not

Table 7-8. Screening of nonradionuclide inorganic contaminants. Bold text indicates that contaminant concentration exceeded EBSL and background.¹

Contaminant	Aluminum ^a	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium ^c	Chromium III ^d	Cobalt
Background (mg/kg) ^a	1.60E+04	4.80E+00	5.80E+00	3.00E+02	1.80E+00	2.20E+00	2.40E+04	3.30E+01	1.10E+01
EBSL (mg/kg) ^b	4.27E+00	7.47E-01	8.76E-01	9.74E-02	7.14E-01	2.36E-03	NA	3.25E+01	4.54E-01
CFA-01	7.87E+03	1.5E+00	6.80E+00 ^e	2.15E+02	2.50E+00 ^e		3.79E+04	5.30E+01	9.70E+00
CFA-02	1.39E+04		1.72E+01	2.69E+02	1.50E+00	2.60E+00 ^f	1.00E+05	2.19E+01	9.90E+00
CFA-03	7.86E+03		8.1E+00 ^e	1.75E+02	1.10E+00	1.30E+00	3.55E+04	1.61E+01	8.80E+00
CFA-04	2.90E+04		2.24E+01	1.11E+03	9.70E-01	6.80E+00	1.01E+05	2.37E+02	1.28E+01
CFA-05 Ditch	3.52E+04	5.80E+00 ^g	1.98E+01	4.34E+02		3.80E+01	4.76E+04	9.13E+01	1.50E+01
CFA-05 Pond	2.25E+04	3.60E+00	9.02E+00	2.54E+02		6.80E+00	1.10E+05	3.49E+01	1.16E+01 ^h
CFA-06			1.45E+01						
CFA-08	1.47E+04	1.50E+00	1.41E+01	4.66E+02	2.50E+00 ^e	2.50E+00 ^h	9.32E+04	7.76E+01	8.40E+00
CFA-10	9.13E+03	9.50E+00	1.16E+01	2.71E+02	8.50E-01	7.30E+00	2.44E+04	1.02E+02	1.57E+01
CFA-12									
CFA-13	6.45E+03	1.15E+01	1.09E+01	1.15E+02	4.70E-01	7.37E+00	6.77E+04	1.79E+02	6.09E+00
CFA-15	1.56E+04		5.57E+00	2.69E+02			5.96E+04	2.20E+01	
CFA-17/47 ⁱ									
CFA-21									
CFA-23									
CFA-24									
CFA-25									
CFA-26 ^j									
CFA-27									
CFA-28									
CFA-29									

Table 7-8. (continued).

Contaminant Background (mg/kg) ^a EBSL (mg/kg) ^b	Aluminum ^c 1.60E+04	Antimony 4.80E+00	Arsenic 5.80E+00	Barium 3.00E+02	Beryllium 1.80E+00	Cadmium 2.20E+00	Calcium ^e 2.40E+04	Chromium III ^d 3.30E+01	Cobalt 1.10E+01
CFA-30	4.27E+00	7.47E-01	8.76E-01	9.74E-02	7.14E-01	2.36E-03	NA	3.25E+01	4.54E-01
CFA-31									
CFA-32									
CFA-34									
CFA-35									
CFA-37									
CFA-38									
CFA-40									
CFA-41									
CFA-43									
CFA-44									
CFA-45									
CFA-48	5.69E+03		3.20E+00	1.28E+02	4.10E-01		2.13E+04	1.92E+01	5.60E+00
CFA-49									
CFA-50									
CFA-51	5.90E+03		7.00E+00 ^e	2.10E+02		1.40E+01	2.40E+04	1.90E+01	6.00E+00

Table 7-8. (continued).

Contaminant Background (mg/kg) ^a EBSL (mg/kg) ^b	Copper 2.20E+01	Iron ^c 2.40E+04	Lead 1.70E+01	Magnesium ^c 1.20E+04	Manganese 4.90E+02	Mercury 5.00E-02	Nickel 3.50E+01	Nitrate NA
CFA-01	7.34E+01	1.60E+04	9.66E+01					
CFA-02	3.02E+01 ^k	2.07E+04	2.55E+02	7.22E+03	4.99E+02	1.90E-01	2.96E+01	
CFA-03	1.53E+01	1.35E+04	1.73E+01 ^m	6.73E+03	3.22E+02		2.38E+01	
CFA-04	3.65E+02	2.29E+04	4.93E+01	1.69E+04	4.41E+02	4.39E+02	3.55E+02	9.00E+01
CFA-05 Ditch	3.42E+02	3.06E+04	6.31E+02	1.14E+04	7.67E+02	5.80E-01	3.67E+01	
CFA-05 Pond	5.86E+01	2.51E+04	1.06E+02	1.35E+04	5.74E+02		2.63E+01	
CFA-06			1.53E+02					
CFA-08	3.30E+01	2.45E+04	2.23E+01	1.53E+04	6.12E+02 ⁿ	5.10E-01	4.51E+01	1.10E+00
CFA-10	2.59E+02	7.35E+04	3.30E+03	6.00E+03	5.09E+02	9.00E-02	1.11E+02	
CFA-12								
CFA-13	1.90E+03	1.42E+04	7.25E+02	1.27E+04	2.84E+02	1.97E+00	8.51E+01	
CFA-15	2.11E+01	2.26E+04	1.57E+01	1.04E+04	4.31E+02	4.20E-01	2.54E+01	
CFA-17/47 ^j								
CFA-21								
CFA-23								
CFA-24								
CFA-25								
CFA-26 ^d								
CFA-27								
CFA-28								

Table 7-8. (continued).

Contaminant Background (mg/kg) ^a	Copper 2.20E+01	Iron ^c 2.40E+04	Lead 1.70E+01	Magnesium ^c 1.20E+04	Manganese 4.90E+02	Mercury 5.00E-02	Nickel 3.50E+01	Nitrate NA
EBSL (mg/kg) ^b	2.11E+00	NA	7.17E-02	2.30E+00	1.41E+01	6.13E-03	2.69E+00	3.20E+01
CFA-29								
CFA-30								
CFA-31								
CFA-32								
CFA-34								
CFA-37								
CFA-38								
CFA-40								
CFA-41								
CFA-43			3.67E+01					
CFA-44			5.11E+01					
CFA-45								
CFA-48	1.55E+01	1.16E+04	4.31E+01	3.68E+03	2.14E+02	1.80E-01	1.74E+01	
CFA-49								
CFA-50								
CFA-51	2.50E+02	1.40E+04	3.70E+01	4.50E+03	2.10E+02		3.40E+01	

Table 7-8. (continued).

Contaminant Background (mg/kg) ^d EBSL (mg/kg) ^h	Potassium ^c 4.30E+03	Selenium 2.20E-01	Silver NA	Sodium ^c 3.20E+02	Sulfide ^d NA	Thallium 4.30E-01	Vanadium 4.00E+01	Zinc 1.50E+02
	NA	8.11E-02	2.99E+00	1.07E+02	1.72E+01	1.17E-01	2.55E-01	6.37E+00
CFA-01	2.62E+03		1.95E+01	2.60E+02		4.2E-01	3.02E+01	2.30E+02
CFA-02	3.50E+03			3.13E+02			3.75E+01	1.07E+02
CFA-03	2.06E+03	4.90E-01 ^p	9.30E-01	2.43E+02			3.34E+01	1.03E+02
CFA-04	3.77E+03		1.21E+02	4.47E+03			5.56E+01	1.31E+02
CFA-05 Ditch	5.43E+03			6.06E+02	9.20E+00	6.90E-01 ^r	4.72E+01	8.58E+02
CFA-05 Pond	5.66E+03			1.10E+03		4.20E-01	3.41E+01	2.41E+02
CFA-06								
CFA-08	2.31E+03	1.40E+00	2.41E+01	9.16E+02			3.61E+01	1.62E+02 ^s
CFA-10	2.15E+03		2.30E+00	2.16E+02			2.74E+01	1.15E+03
CFA-12								
CFA-13	1.19E+03	5.43E-01	1.94E+01	4.22E+02		2.60E-01	1.94E+01	3.02E+02
CFA-15	2.23E+03		4.20E-01	5.54E+02		2.00E-01	3.03E+01	7.96E+01
CFA-17/47 ⁱ								
CFA-21								
CFA-23								
CFA-24								
CFA-25								
CFA-26								
CFA-27								
CFA-28								

Table 7-8. (continued).

Contaminant Background (mg/kg) ^a EBSL (mg/kg) ^b	Potassium ^c 4.30E+03 NA	Selenium 2.20E-01 8.11E-02	Silver NA 2.99E+00	Sodium ^c 3.20E+02 1.07E+02	Sulfide ^d NA 1.72E+01	Thallium 4.30E-01 1.17E-01	Vanadium 4.00E+01 2.55E-01	Zinc 1.50E+02 6.37E+00
CFA-29								
CFA-30								
CFA-31								
CFA-32								
CFA-34								
CFA-37								
CFA-38								
CFA-40								
CFA-41								
CFA-43								
CFA-44								
CFA-45								
CFA-48	1.18E+03		2.40E+00	1.27E+02				
CFA-49								
CFA-50								

Table 7-8. (continued).

Contaminant Background (mg/kg) ^a	Potassium ^c 4.30E+03	Selenium 2.20E-01	Silver NA	Sodium ^c 3.20E+02	Sulfide ^d NA	Thallium 4.30E-01	Vanadium 4.00E+01	Zinc 1.50E+02
EBSL (mg/kg) ^b	NA	8.11E-02	2.99E+00	1.07E+02	1.72E+01	1.17E-01	2.55E-01	6.37E+00
CFA-51	1.20E+03	6.00E-01		1.00E+02			2.20E+01	3.40E+02

a. Background values (mg/kg) are the 95%/95% UTL for composite samples (Rood, Harris and White, 1996).

b. The minimum EBSL (mg/kg) for all receptors and functional groups.

c. As with the human health, it is appropriate to screen six inorganic constituents which are not associated with toxicity under normal circumstances. These include aluminum, calcium, iron, magnesium, potassium, and sodium. These will be eliminated if the concentration is less than 10 times background.

d. Chromium was assessed as chromium (III) since chromium is not expected to persist in the environment at the INEEL in the chromium VI form (Bartlett and Kimble, 1976; Rai et al., 1989). Additionally, 10 grid locations at PBF-10 (a dried pond site in 1965) were sampled for both chromium III and VI. The ratio of chromium III to VI averaged 0.0085 (with a range of 0.00017 to 0.053). Based on this information and the ratio of chromium III to VI EBSLs (0.162 to 3.25 [0.05]), it is unlikely that chromium VI would pose a risk unless chromium III first was shown to be a risk.

e. As discussed in the human health assessment, arsenic and beryllium are commonly detected in INEEL soil at concentrations slightly higher than background values. However, neither contaminant is associated with waste-producing processes at WAG 4. Therefore, arsenic at CFA-01, CFA-03, and CFA-51 and beryllium at CFA-01 and CFA-08 were eliminated from further evaluation in the ERA.

f. Cadmium at CFA-02—1 sample out of 21 exceeded background (1/21 = FOE of <5%). This concentration, 2.6 mg/kg, is below the 95%/99% UTL (2.7 mg/kg). It is warranted to remove the site based on this criteria when the FOE of the 95%/95% UTL for background is less than 5% (see Section 5.2 Rood et al., 1996).

g. Antimony at CFA-05—2 samples out of 61 exceeded background (2/61 = frequency of exceedence [FOE] of 3%). These concentrations are 5.8 mg/kg (BN *J flagged) and 5.6 mg/kg (BN flagged); the next highest level was 4.6 mg/kg. Therefore, antimony is removed as a contaminant of concern at this site.

h. Cobalt is eliminated because out of 22 samples, two slightly exceeded background (11.6 and 11.4) both at depth (below 6 ft).

i. Cadmium at CFA-08—1 sample out of 21 exceeded background (1/21 = FOE of <5%). This concentration, 2.5 mg/kg, is below the 95%/99% UTL (2.7 mg/kg). It is warranted to remove the site based on this criteria when the FOE of the 95%/95% UTL for background is less than 5% (see Section 5.2 Rood et al., 1996).

j. Post remediation results presented here include only the 69 locations that were resampled at CFA-17/47.

k. The copper at CFA-02 was eliminated as a contaminant of concern: 22 samples were collected at this location. The 3.02 mg/kg concentration was from a grab sample and does not exceed 95%/95% of 32 mg/kg for grab samples (Rood et al. 1996). The next highest level was 20.8 mg/kg.

l. Manganese at CFA-02 was eliminated as a contaminant of concern: the largest concentration of 22 samples is 4.99E+02 mg/kg (NJP flag). The next highest level is 395 mg/kg.

m. Lead at CFA-03—1 sample out of 12 exceeded background (17.3 mg/kg). This sample was NJ flagged indicating that lead was positively identified but the associated numerical value may not be consistent with the amount actually present in the environment. Therefore, this contaminant was eliminated as a COPC at this site.

n. Manganese at CFA-08 is eliminated as a contaminant of concern: only one concentration (NJ flag) out of 20 samples, is greater than background. The next highest level is 408 mg/kg (see Appendix B)

Table 7-8. (continued).

Contaminant	Potassium ^c	Selenium	Silver	Sodium ^c	Sulfide ^q	Thallium	Vanadium	Zinc
Background	4.30E+03	2.20E-01	NA	3.20E+02	NA	4.30E-01	4.00E+01	1.50E+02
(mg/kg) ^a								
EBSL	NA	8.11E-02	2.99E+00	1.07E+02	1.72E+01	1.17E-01	2.55E-01	6.37E+00
(mg/kg) ^b								

p. Selenium at CFA-03 was eliminated as a contaminant of concern: 12 samples were collect at this site. Concentrations ranged from ND to 0.49 mg/kg. The three concentrations (0.49, 0.45, and 0.43) were flagged with BNJ, meaning the analyte was positively identified but the associated numerical value may not be consistent with amount actually present. The remaining levels were below the detection limit. Selenium is not expected to have been released at this site.

q. Sulfide values at CFA-05 were screened using sulfate EBSL.

r. Thallium at CFA-05 was eliminated as a contaminant of concern: 1 sample out of 52 exceeded background (FOE <2%). Sample was taken at 6–6.5 ft below surface. The next highest hit was 0.42 mg/kg.

s. Zinc at CFA-08 was eliminated as a contaminant of concern: 1 concentration (NJ flag), out of 21 samples, is greater than background. The next highest level is 1.47E+02 mg/kg.

t. Refer to Appendix B data for verified maximum concentration. Some values may have changed during addition of later data sets that were not noted during this DAR.